PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (**http://bmjopen.bmj.com/site/about/resources/checklist.pdf**) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Relationship between Socioeconomic Status and Type 2 Diabetes: Results from the Korea National Health and Nutrition Examination Survey (KNHANES) 2010-2012
AUTHORS	Hwang, Jongnam; Shon, Changwoo

VERSION 1 - REVIEW

REVIEWER	Jongho Heo Public Health Joint Doctoral Program, San Diego State University & University of California, San Diego, USA
REVIEW RETURNED	03-Jun-2014

GENERAL COMMENTS	*Major points*
	1. Elaborate gap identification The weakest point of this study may be the differentiating with previous studies in western countries and highlighting novel findings of this study. Not to be a me-too study, I would suggest elaborating the gap identification and stressing the novelty of this study.
	Are there any public health issues on type 2 diabetes in Asia or especially in Korea, which are more problematic or needs interests of international public health area? In the introduction (page 4), authors need to explain more about the current situations or trends of type 2 diabetes in Korea. How much they have changed? Which factors in diet, life style, and SES were associated with the outcome? How were they related with the outcome? This may require rewriting the sentences in 23-32 lines, page 4.
	The strengths of the study (page 3) were mentioned with 3 points; however, they are somewhat overlapped and repeated. Consider rewriting them succinctly and clearly. Additionally, are you sure that this is the first attempt using a nationally representative survey (in the 3rd point of the strengths)?
	2. The Figure 1 I wonder which analysis the figure 1 is based on. If it is just a descriptive graph based on a tabulation of the prevalence, it is needless. I would recommend drawing a predicted probability graph based on the final regression model.

3. Rewrite the discussion
The discussion part is needed to be strengthened with succinct sentences and rearranging logical flow. There are redundancies in explaining main findings. Moreover, the discussion should be rearranged based on the importance of findings, and they should be followed by elaborated discussion based on previous studies. In short, state main findings clearly, elaborate to interpret findings in terms of those of previous studies, and explain more why they are different.

4. Needs for language editing
I strongly recommend the authors to have the manuscript revised or edited by a native English speaker. There are awkward expressions and typos as well throughout the manuscript. For example, "fact by face" in the 21th line of the page 5; "hi-risk" in the 51th line of the page 6; several periods after citation number at the end of sentences; Oxford commas were used inconsistently.

Minor points

PAGE 2: Abstract
1. The primary outcome should be described more clearly because it may seem that there are two outcomes: self-rated one and diagnosed one.
2. In the 28th line, logistic means logistic regression?
3. In the 30th line, describe what the various socio-economic factors are.
4. Values of ORs and 95% CIs in the results should be clarified with separating the values with related categories of income and education.
5. In the 50th line, social determinant of what?

PAGE 5
1. It is unclear about the sample size. The total of 24,173 was total sample size of the survey or was included in this study? Individuals of 17,033 were diabetes patients or total sample size for this study?
2. Information of missing values should be contained in the methods. How many (%) samples were excluded or which variables and how much they had missing values?

PAGE 6
1. In the 48th line, did physical activity have just two categories, moderate and vigorous? They are mutually exclusive?
2. In the 58th line, for the criteria of high risk drinking, the citation should be provided.

PAGE 7
1. The subtitle, "statistical analysis" may be needed.
2. Describe how the 4 models were built in the statistical analysis.
3. In the 14th line, what is the high risk behavior? High risk drinking?
4. In the 1st paragraph of the results, provide % of the individuals

with diabetes.
5. In the 47th line, P is the capital.

PAGE 8
1. Interpreting ORs as percentages of probability is incorrect. Such an interpreting is appropriate for RRs not ORs.
2. As this study is cross-sectional, you cannot estimate the effects of factors; you just can estimate associations between dependent and independent variables.
3. In 38th line, obese condition or BMI? Use variable names consistently throughout the manuscript. Compare the description with the results in the abstract, the 1st paragraph of the discussion, and other parts which explained covariates.
4. In the 1st paragraph of the discussion, consider rewriting to provide main and novel findings of this study.

PAGE 9
1. There may be a missing "and" in the 20th line.

TABLE 1
1. Consider deleting the first two columns (estimated population and its percentage) or place them ahead of the p-value column.
2. Again, use name of variables consistently throughout the manuscript.

TABLE 2
1. There is no p-value such as 0.00. Does 0.00* means 0.001 or 0.01?
2. There is no reference category for the variables inserted into the models.
3. Choose either presenting stars or values for the significance. If you are to use stars, categorize the significance with numbers of stars, i.e. $*p<0.05$, $**p<0.01$, $***p<0.001$.

REVIEWER	Heeran Chun
	Jungwon University, Chung-buk, South Korea
REVIEW RETURNED	12-Jun-2014

GENERAL COMMENTS	This manuscript shows the socioeconomic correlates in diabetes prevalence using representative data of South Koreans. The paper is well-written with in-depth references but further analysis is recommended before consideration of publication.
	Recommendation for analyses
	1. Inclusion of Health Examination data for diabetes prevalence: As indicated in reference 15 on KNHANES design, not only reported but measured diabetes prevalence can be calculated with KNHANES data. The official report also publishes the prevalence of diabetes with cases including "1) physician diagnosed (reported) 2) Fasting glucose level 126mg/dL + (examined) 3) Under treatment (Taking insulin or medicine)

	2. Age cut-off for inclusion criteria should start from 30 above as in most official reports.
	3. Gender segregated analysis. Or at least, interaction term with gender*outcome in multivariate analysis needs to be considered. Socioeconomic patterns in diabetes and obesity are particularly gender-differential in current South Korean data. Inverse relationship with diabetes prevalence was observed only among women, not among men, in previous studies.

4. Table 1. the section "Type 2 Diabetes – No" column may not be needed. Instead, authors can add age-adjusted prevalence (95% CI) of diabetes prevalence right next to crude rate(%).
5. Table 2. Multivariate analysis
Model 1. Age-adjusted DM prevalence according to household income.
Model 2. Age- adjusted DM prevalence according to Education.
Model 3. M1, M2, + Demographic
Model 4. M3 + Health Behaviors

6. If not counted, it would be good to use equivalized household income – (total household income divided by the swuare root of the numbers of household members).
7. Use "highest" group as reference (when diseases are outcomes), relative risk comparison should be more clear. |

VERSION 1 – AUTHOR RESPONSE

Reviewer 1 – Dr. Jongho Heo

1. Elaborating gap identification
In respond to your comments, we revised the introduction section by highlighting 1) current trends of type 2 diabetes in Korea 2) factors associated with type 2 diabetes in Korea, 3)an association between increasing prevalence of type 2 diabetes and worse health outcomes.
In addition, we modified the strengths of the study (page 3).

2. Figure 1
Our initial purpose of having figure 1 was providing descriptive information on income and type 2 diabetes. We agreed that this figure may not provide necessary information considering the purpose of our study, so we excluded figure 1.

3. Rewrite the discussion
In order to provide more clear messages in the discussion, we prioritized our main findings and re-arranged some paragraphs which deliver our main message more clearly.

4. Need for language editing
The whole manuscript for syntax errors was checked and modified some errors. In addition, the manuscript was reviewed and edited by a native English speaker as recommended.

Minor points
1. Page 2
All errors were corrected.

2. Page 5
We clarified a total number of individuals who participated in KNHANES survey and a total sample size (N=14,330) for our study.

3. Page 6
1) Yes. Physical activity is generally categorized into moderate and vigorous activity. These are mutually exclusive.
2) Citation for high-risk drinking was added.

4. Page 7
1) Subtitled was added.
2) We added explanations for sequential adjustment.
3) Error was corrected.
4) We added % of individuals with type 2 diabetes.
5) Error was corrected.

5. Page 8
1) Interpretation for ORs was revised.
2) The sentence was revised.
3) We revised all names of variables.
4) We also revised the discussion section as you suggested.

6. Table 1 & Table 2
Table 1 and 2 were revised based on both review 1 and 2's comments.

Reviewer 2 – Dr. Heeran Chun

1. Inclusion of KNHANES for diabetes prevalence
As suggested, we adopted KNHANES official classification for diabetes prevalence and re-conducted all data analyses.

2. Age cut-off for inclusion criteria
It was our concern to identify and exclude individuals with type 1 diabetes. To clarify type 2 diabetes patients in our study, we excluded patients with diabetes under 30 years old as suggested.

3. Gender segregated analysis
We were also aware of gender-related different relationship between SES and health outcomes (including type 2 diabetes) as addressed in previous studies. In respond to the comment, we included a gender stratified model in our analysis. In addition, we added the need for further study on gender-related difference on SES and type 2 diabetes in the discussion section.

4 & 5. Tables
All tables were revised as you suggested.

6. Household income
We used equivalized household income as suggested in the KNAHNES data user guide, but we failed to clearly indicate in earlier version of our manuscript. We clarified the definition of (equivalized) household in the methods section.

7. Reference group
We all changed "highest" group as reference group and re-conducted all analyses.

REVIEWER	Jongho Heo San Diego State University & University of California, San Diego
REVIEW RETURNED	16-Jul-2014

GENERAL COMMENTS	all the issues which were raised for the first draft were adequately addressed.

REVIEWER	Heeran Chun Jungwon University, South Korea
REVIEW RETURNED	01-Aug-2014

- The reviewer completed the checklist but made no further comments.